

## CLAIMS

5 1 Instrument for non invasive measurement of the three-dimensional distribution of the temperatures of dielectric objects, with the inclusion of human organs or other biological tissues, characterised by the fact that it uses sensors to determine the electromagnetic heat emission power in a frequency range between the radio wave frequency and the one of infrared radiation, mounted on supports that are adjustable and movable in space, so as that, remaining fixed the object of which one wants to determine the three-dimensional distribution of the temperature, the various sensors can be positioned in such a way as to measure the emission along directions that have been pre-established by the observer. The movement of the sensors may occur both 10 automatically and manually. The data measured by the sensors are sent through opportune interfaces to the data memorisation system that are able to re-elaborate the experimental information (total emission of electromagnetic waves of the object at various wave lengths and through various directions and/or distances), resolving integral equations with Fridgolm type methods, setting as output the three-dimensional map of the temperatures.

15 2 Instruments for non invasive measurement of the three-dimensional distribution of the temperatures of the dielectric objects according to the second claim characterised by the fact that the maps are supplied as a table.

20 3 Instruments for non invasive measurement of the three-dimensional distribution of the dielectric objects according to the second claim characterised by the fact that the maps are supplied on a screen.

4. Instruments for non invasive measurement of the three-dimensional distribution of the temperatures of the dielectric objects according to the second claim characterised by the fact that the maps are supplied as thermal maps

25 5 Non invasive measurement methods of the three-dimensional distribution of the temperatures of the dielectric objects using an instrument of the type described in any of the claims from 1 to 4 according to the second claim characterised by the fact that it uses a reconstructive approach of the point like temperatures based on the use of the Raley-Jeans or similar equations, that uses calculus algorithms of the three-dimensional thermal distribution may be based on models in which the link between the emission intensities and the temperature profiles are expressed through 30 Fridgolm integrals equations or by other similar equations.

6. Non invasive measurement methods of the three-dimensional distribution of the temperatures of the dielectric objects according to claim n° 5 characterised by the fact that the registration of the

thermometric data, the data registration and its handling, both automatically through opportune algorithms, apart from their specific nature.

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- 7. Non invasive measurement methods of the three-dimensional distribution of the dielectric objects according to claim n° 5 characterised by the fact that it is used for medical-diagnostic purposes, on human internal organs.
- 8. Non invasive measurement methods of the three-dimensional distribution of the temperatures of the dielectric objects according to claim n° 5 characterised by the fact that the operator manually determines topological parameters for sensor handling working on gradually increasing or decreasing wave lengths.
- 10 9. Non invasive measurement methods of the three-dimensional distribution of the temperatures of the dielectric objects according to claim n° 5 characterised by the fact that the sensor handling is automatic and occurs according to pre-established programs, that can be chosen by the operator.

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